

**REMARKS**Status of the Claims

Claims 1-26 are currently pending.

Claim 1 has been amended without introducing new matter.

Claim 27 has previously been canceled.

Claims 28-49 stand withdrawn as directed to a non-elected invention.

Claim Rejections – 35 U.S.C. § 103

Claims 1-4, 7-9, and 11-23 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent No. 4,092,443 to Green in view of U.S. patent No. 5,145,621 to Pratt. Reconsideration and withdrawal of this rejection are respectfully requested.

As amended herein, base claim 1 calls for, *inter alia*, a precomposite comprised of reinforcement fibers impregnated with a resin-containing composition that has been subject to ionizing radiation "for a predetermined time in order (i) partially to polymerize the resin so as to obtain a precomposite in which said composition is in a solid phase and which is resistant to buckling of said fibers upon flexure, and (ii) to limit polymerization so as to permit bonding of said precomposite either to another precomposite or to rubber . . ." (emphasis added). The object of such limited partial polymerization in accordance with the invention is twofold: first, to achieve a minimum level of polymerization sufficient to impart resistance to buckling of the reinforcement fibers upon flexure upon stacking of the precomposite(s) on a non-planar shape (Spec., page. 6, lines 19-22), and second, not to exceed a maximum level of polymerization which permits bonding of the shaped precomposite to another precomposite or to rubber (Spec., page 7, lines 1-5). The Green and Pratt patents, whether taken alone or in combination, fail to disclose or suggest this limited polymerization step.

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The Green patent generally discloses the formation of reinforced composites comprised of fibrous reinforcing material impregnated by photopolymerizable resin compositions, which are initially converted into a solid, but still heat curable, state by exposure to actinic radiation and which are thereafter fully cured by heating. (Col. 1, lines 55-68) The Green patent does not disclose or suggest, however, that the polymerization by exposure to actinic radiation should be limited to the range wherein, as a minimum, the prepreg is resistant to buckling of the fibrous reinforcing material upon the application thereof to a non-planar shape and, as a maximum, the prepreg can be bonded to another prepreg by further polymerization. Although Green mentions that "[p]roducts made in accordance with the invention may be in the form of flat sheets or shaped articles" (Col. 16, lines 40-42), he exhibits no recognition and makes no teaching of applicants' claimed step of so controlling the partial polymerization by radiation as to prevent buckling of the reinforcement fibers during the subsequent shaping step. Indeed, Green does not address at all the production of composite parts which are capable of being subject to high mechanical stress, and is entirely silent concerning any controls or limitations on the polymerization process in order to obtain such high performance composite parts of non-planar shape.

None of the examples set forth in the Green patent even describes the shaping of a prepreg about a non-planar surface, let alone the concept of irradiating the reinforced resin compositions for a predetermined time to achieve non-buckling of the fibers during subsequent non-planar shaping and stressing. The only specific disclosure in the Green patent of the non-planar shaping of a composite product is the reference at Col. 16, lines 42-46, to the shaping of a hollow article. As there described, a continuous tow of fibrous reinforcing material is impregnated with a liquid resin composition and wound around a former while, at the same time,

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exposing the winding to actinic radiation. This teaching of Green leads away from applicants' claimed invention, wherein, in direct contrast, the fibrous resin composition is first exposed to ionizing radiation to form a solid partially polymerized precomposite before it is applied to a non-planar shape.

In view of the foregoing fundamental differences between the claimed invention and the Green patent, one skilled in the art would not be led to the applicant's claimed invention by Green's teaching.

The Pratt patent has been cited as teaching the stacking and consolidated of prepregs to form a laminate without gaps between the layers. Even assuming, however, that Pratt's teaching of stacked prepregs is applicable to the Green prepregs (which applicants do not admit), the combined Green-Pratt process still would not provide the claimed invention or realize its advantages because the Pratt patent includes no disclosure or suggestion of a limited partial polymerization step as claimed by applicants.

We submit, therefore, that base claim 1 defines patentably over the Green and Pratt patents. As all of the claims 2-4, 7-9, and 11-23 are dependent upon claim 1, they are likewise patentable over the Green and Pratt patents for the reasons stated in connection with claim 1.

Claims 5 and 6 have been rejected under 35 U.S.C. 103(a) as unpatentable over the Green and Pratt patents as applied to claim 1, and further in view of U.S. patent No. 5,439,353 to Cook et al. Reconsideration and withdrawal of this rejection are respectfully requested.

The Cook et al. patent has been cited as teaching that the prepregs could be stacked individually or in groups on a mold surface. Cook et al., however, do not disclose or

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suggest the aforementioned limited partial polymerization step of claim 1. Hence, claims 5 and 6 are patentable over the cited art for the reasons stated above.

Claim 10 has been rejected under 35 U.S.C. 103(a) as unpatentable over the Green and Pratt patents as applied against claim 1, and further in view of U.S. patent No. 4,065,340 to Dickerson. Reconsideration and withdrawal of this rejection are respectfully requested.

The Dickerson patent has been cited as teaching the partial curing of the prepregs under vacuum. The Dickerson patent, however, fails to disclose or suggest the aforementioned steps of base claim 1 missing from the Green and Pratt patents. Accordingly, claim 10 distinguishes patentably over the cited references along with its parent claim 1.

Claims 24 and 26 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent No. 6,117,258 to Spragg et al. in view of U.S. patent No. 4,734,144 to Markow and the Green patent.

The Spragg et al. patent and the Markow patent are cited for the disclosure of the use of fibrous thermosetting materials as run-flat elements in a tire. Neither patent, however, discloses or suggests a process for the manufacture of composite parts as called for by claim 1. In recognition of this deficiency in the Spragg et al. and Markow patents, the Examiner has referred to the Green patent for the structure of the reinforced resin composite material and how it is made. For the reasons already stated, the Green patent fails to render obvious the invention of claim 1, from which claims 24 and 26 depend. Thus, claims 24 and 26 are patentable over the Spragg et al., Markow and Green patents.

Claim 25 has been rejected under 35 U.S.C. 103(a) as unpatentable over the Spragg et al. patent, the Markow patent, and the Green patent as applied to claim 24, and further

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in view of U.S. patent No. 6,248,450 to Voss et al. Reconsideration and withdrawal of this rejected are respectfully requested.

The Voss et al. patent is cited solely for the disclosure of the use of resorcinol formaldehyde latex glue to bond rubber to synthetic fibers. Claim 25 remains patentable over the cited art for the same reasons as base claim 1, from which it depends.

Conclusion

In view of the foregoing, we respectfully submit that claims 1-26 define patentably over the prior art and are allowable. Issuance of the application to patent is respectfully requested.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Richard G. Berkley", is written over a horizontal line.

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